

Brijuni Archipelago: Story of Kupelwieser, Koch, and Cultivation of 14 Islands

Istria, the largest Croatian peninsula located in the Northern Adriatic, has always been widely recognized for the beauty of its nature and mild, Mediterranean climate. It was well populated even in Roman times, although the oldest traces of human life date from as early as Paleolithic. Istria was settled by Croats in the 7th century. Its history abounds with battles and legends, especially from the periods of famine and plague. Due to a specific mentality and culture of the area, Istria became the cradle of Glagolitic Croatian literature. Often called *terra magica*, it is today the most developed tourist region in Croatia, with more than two million visitors each year.

Throughout the history, the peninsula was ravaged by different epidemics. Plague almost wiped out the population inhabiting the area and many a town became completely deserted (1). Malaria was an Istrian reality for centuries and its destructive consequences have been reported by various physicians (2-4). It was particularly severe before the use of chinchona bark, a therapy introduced in Europe in the early 17th century but unknown in Istria until the second half of 18th century (1). One of the greatest focal points of malaria were the Brijuni islands, located across the Fažana Channel to the southwest of Istrian coast. Mild climate favors growth of dense flora of Mediterranean and subtropical type, and nu-

merous lagoons and ponds make a fertile soil for mosquitoes, which played a decisive role in malaria transmission.

The Brijuni were inhabited as early as prehistoric times. In the mid-second millennium B.C., the Illyrian tribe of *Histri* lived here. Under Roman rule in 177 B.C., islands were named *Pullariae*. Archeological findings in Verige bay (see cover page) of Veli Brijun indicate there once stood an imperial summer residence, a luxurious Roman *villa rustica* from the first century A.D., as well as three temples, residences for priests, baths, waterworks, sewage system, and so on. During Byzantine rule, life was centered in Dobrička. A well-fortified fortress testifies that people lived there from the 2nd century B.C. to the 14th century A.D. (5). Medieval remains, on the other hand, preserved evidence of another type of architecture and specific mentality. A rectangular tower-dungeon from the 12th century, a three-nave basilica of Benedictine monastery, and St German's and St Roch's churches reflect a culture deeply rooted in Christian religion, so typical of medieval Europe. In the 14th century, the Brijuni islands came under Venetian rule but were soon abandoned because of malaria, remaining almost deserted in the following centuries because of the disease, as evidenced by historical records.

Hopelessness and death, hunger and poverty, malaria and other diseases marked the subsequent centuries – not surprisingly, Alberto Fortis (1741-1803) noted, when he performed his first *viaggio* in 1765, that people in Istria appear poor and rude (*rozzi abitanti*) (6). Fortis' report was the first description that successfully directed European public attention to particular features of Istria and Dalmatia and was followed afterwards by similar reports of other authors. However, the costal part of Croatia was less exotic and more attractive in later periods. This was the result of popular trends in climatology, thalassotherapy, and balneotherapy, all developments of the 19th century Europe and on the rise since John Coakley Lettsom (1744-1815) opened the first hospital at Themse-Margate in 1796 (7). The newly discovered therapeutic benefit of sea and climate sojourns were propagated as *natural remedies*, and health and spa tourism flourished. The costal areas and islands were declared as having particularly beneficial effects and praised by various authors (7). The first investments in regional health tourism on Istrian territory were made in Opatija, a small town on the eastern coast of Istria. Soon afterwards, similar projects were undertaken on the Brijuni islands, particularly after Conrad Clar's article from 1885 emphasizing their potential as a health resort (8).

After seeing their fascinating beauty, it did not take long for Austrian industrial magnate Paul Kupelwieser (1843-1919) to buy the islands, in 1893, and transform them into an exclusive summer resort. Although the chairman of a steel mill in Czech Vitkovice and an expert in metal processing, Kupelwieser did not hesitate about leaving the mill and dedicating himself to his new project – building of a health center and summer resort on the islands (9). It was a risky adventure for many reasons, primarily because of malaria, which was seriously jeopardizing the project.

By the end of the century when Kupelwieser bought Brijuni for 70000 gold forints, research

into the etiology of malaria had already gone quite far. The whole story started when Charles L.A. Laveran (1845-1922) described the gametes of malaria parasites in human erythrocytes. Besides, Ronald Ross (1857-1932) observed developing plasmodia in the intestine of mosquitoes and supported the theory that malaria was transmitted by those intermediate insect vectors. However, it was not until the mid-19th century that quinine was identified as the active alkaloid (10). At the turn of the 19th to 20th century, Robert Koch (1843-1910) set out to prove scientifically the cause of the various diseases and was soon appointed a member of the Imperial Health Bureau in Berlin. In 1896, when he went to South Africa to study the cause of rinderpest, the first guests disembarked on the Brijuni and archaeological and conservational work was under way. By the time Koch started investigating malaria in India and Africa, building of hotels and villas on the Brijuni islands had already begun. Promenades and swimming pools with heated sea water were erected and stables and sport grounds built, including a golf course, the largest in Europe at the time. Everything seemed to be in progress except for the most difficult and centuries-long battle against malaria; Kupelwieser himself fell victim to the disease. In that period, Koch was deep into his studies in the etiology of the different forms of malaria and quinine-based treatment and when he received Kupelwieser's invitation to the Brijuni, he readily accepted it. According to Koch's instructions, all the ponds and marshes where mosquitoes hatched were filled up with dirt and patients were treated with quinine. Koch spent two years, from 1900 to 1902, on the Brijuni islands and successfully eradicated the disease. Grateful for these efforts, Kupelwieser erected the sculpture in honor of Koch, which still stands in vicinity of the 15th century St German's church on the Great Brijun.

Kupelwieser and Koch's efforts resulted in the Brijuni becoming a prestigious health resort, visited by the social, political and artistic elite

of the time: archdukes, princes, princesses, artists, and writers like Thomas Mann, James Joyce, Richard and Oskar Strauss, and many others.

Over time, historical circumstances changed, not always in favor of the Brijuni, but Kupelwieser's resort and spa remained. They were preserved, even revitalized and used as a hidden oasis for presidents and other celebrities during the second half of the previous century. The Brijuni archipelago, which consists of 14 islands and islets (*Veliki Brion, Mali Brion, Sveti Marko, Gaz, Okrugljak, Supin, Supinic, Galija, Grunj, Vanga, Madona, Vrsar, Jerolim, and Kozada*) and covers an area of 748 hectares, are still as attractive as they were a hundred years ago (5). Moreover, due to the fact that the Brijuni islands have been a protected area for decades, the sea there is still the cleanest part of the waters around Istria. Almost half of the Big Brijun island is a park filled with landscape gardens and meadows. Animals, such as deer and elephants, were brought there in 1900 and soon became a trademark of the island. In 1978, a safari park was opened on the northern edge of the island and on November 9, 1983, the Brijuni islands were declared a national park (11).

Both Kupelwieser and Koch lived and participated in an era when most idealistic image of medicine was created, when people started to believe that microbes were neither a threat nor a challenge to the mankind. Hundred years after Koch conquered malaria on the Brijuni islands, we are faced many more dangerous infectious diseases. In such circumstances, an unspoiled natural oasis such as the Brijuni islands should

encourage better stewardship of our planet not only for the sake of humankind, but also for all other species, including microbes that we live with. This is the challenge that Kupelwieser and Koch understood, and their heritage should be cherished and preserved, because this is the only way in which the nature reciprocates.

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